SCIENCE NEWS

Science Service, Washington, D. C.

GLOBULAR STAR CLUSTERS

WATCH-SHAPED groups of myriads of stars, with long spiral arms like those of a fiery pin-wheel, may be "young" galaxies that will eventually develop into compact globular clusters of suns, Dr. Harlow Shapley, director of the Harvard College Observatory, stated recently upon receiving the Franklin Medal, the highest award of the Franklin Institute.

"The suggested direction of evolution is the reverse of that proposed by Sir James Jeans many years ago, who assumed that the spheroidal galaxies, through rotation, become flattened and develop spiral arms," Dr. Shapley said in presenting his alternative tentative hypothesis as to how galaxies evolve.

Spiral galaxies, like our own Milky Way system, contain many clouds of stars and star-dust. Differential rotation within such galaxies would gradually tend to eliminate these clusters and clouds. Thus, as they develop, the spiral galaxies should become free of such non-uniformities and take on the smooth structure characteristic of the spheroidal galaxy.

Like our own Milky Way, the wheel-shaped galaxy contains many supergiant stars. Stars which cluster together in elliptical and spherical systems, on the other hand, are almost never supergiants. Since it is at present believed that the life of a supergiant star is relatively short, the existence of supergiants would indicate that the spirals are less developed unless such supergiant stars are still being born.

New studies made with the South African reflector of the Harvard Observatory suggest that there are truly transitional types between the open and the compact star clusters—a phenomenon that had not been evident from the studies of the globular clusters of our own galaxy.

Our own Milky Way is about 100,000 light years in thickness. Remeasurement of the distances of about 30 of the 100 globular clusters of our galaxy established the thickness of the haze of stars and clusters that surrounds the flattened watch-shaped main body of the galactic system.

Giant globular clusters are about as bright and of the same general structure as the nuclei of some of the spiral galaxies. From comparisons of the greatest of globular clusters and the smallest of the spheroidal galaxies, it is believed that clusters like the southern hemisphere groups of stars, Omega Centauri and 47 Tucanae, are partially related to such galaxies as the companions of the great Andromeda Nebula, our nearest neighbor.

The study of globular star clusters has made four major contributions to the study of the sidereal universe:

The first developed rapidly at the Harvard Observatory about fifty years ago when Professor S. I. Bailey began his extensive work in the discovery and study of variable stars in the brighter globular clusters. Eventually a dozen workers entered the field. The "cluster-type Cepheids" were linked up with the regular or classical Cepheids into the period-luminosity relation, which has provided us the yardstick for measuring our galaxy and others.

The second somewhat revolutionary discovery concerns the candle-powers and colors of stars in globular star clusters. The distribution of the cluster stars among the various candle-powers and spectral classes (colors) was found to be distinctly different from that of stars that surround the sun. Later this globular cluster distribution was found to be characteristic of the nucleus of our galaxy and the nuclei of other spiral galaxies like the Andromeda Nebula; and similar also to the distribution in the great spheroidal galaxies.

Through their non-symmetrical distribution in the sky, globular clusters gave us our first clear indication that the center of our galaxy is very distant in the direction of Sagittarius.

The high radial velocities, frequently more than a hundred miles a second, have shown that the clusters, perhaps like high-latitude Cepheid variables, have a peculiar part in the structure of the galaxy, unlike that of neighboring stars or the stars of the Milky Way.

ITEMS

INFANTILE paralysis cases have been persistently higher so far this year than for any of the five past years at this season. The number reported to the U. S. Public Health Service, Washington, D. C., from the first of the year to the week ending April 7 is 484. The highest figure for the same period during the last five years was 377 in 1940. Although it is too early to predict what will happen when summer, the infantile paralysis season, arrives, the next few weeks may tell whether another epidemic is on the way. Of the year's total so far, about one fourth of the cases have been reported from New York State. The rest have been scattered throughout the country.

LIFE jackets and life preservers used by the armed forces and merchant marine will soon be packed with a new fibrous glass material, as the 10,000,000-pound stockpile of kapok and substitutes such as milkweed fiber and Ecuador kapok threatens to become depleted by the end of this year, according to a report of the U. S. Coast Guard. Selected as the best substitute for kapok life-jacket filler after exploratory tests had been conducted on a number of materials at the Mellon Institute of Industrial Research, fibrous glass has many superior qualities. It is fire-proof, more resistant to being packed down under compression, and does not absorb water as rapidly as kapok. Before the war, America imported up to 10,000 tons of kapok annually. Most of it came from Java, and this source of supply was cut off when that country was invaded by the Japanese. A soft, fluffy fiber, kapok is secured from the pods of the bombax tree. The clumps of fiber were removed from mature pods, cured in the sun and compressed into bales by native labor.